CHEMISTRY TECHNICAL REQUIREMENTS

1. Introduction. This attachment provides general information on chemical analysis to USACE and architect and engineering firms (A-E) for investigative projects where chemical analyses are being conducted. Projects considered as investigative include: PA/SI, RI/FS, EECA, RFA, RFI, and CMS. Information is summarized in subsequent sections for the Chemical Data Acquisition Plan (CDAP), requirements for primary (contractor) laboratory approval, and other miscellaneous requirements. The purpose of the CDAP is to assure that the A-E understands the sampling and analysis requirements (including chemical quality management details) of the scope of services and the Government approves of the A-E's implementation procedures as per contract.

2. CDAP Format and Implementation Requirements. The following is a guideline of elements to be included in the CDAP (as a minimum) and guidance on their implementation. Additional requirements are outlined in appropriate sections of the accompanying Scope of Services.
(In many cases the project is being conducted under the authority of the USEPA. The language used for submittals may differ depending on the applicable regulatory program. Under CERCLA, guidance may require the preparation of a Sampling and Analysis Plan (SAP) or Field Sampling Plan (FSP), and a Quality Assurance Project Plan (QAPjP); or under RCRA a Data Collection Quality Assurance Plan and Data Management Plan may be requested. In either case, the state or federal substantive requirements of the document(s) must be investigated to assure that all are being incorporated. One may investigate with the regulating office the option to use the language and plan approach outlined within USACE guidance (i.e. CDAP), or use the format and content as outlined by the regulatory program. Regardless of the approach taken, the USACE guidance set forth for the Chemical Data Acquisition Plan (CDAP) is considered the functional equivalent to the Data Collection Quality Assurance Plan and the Data Management Plan under RCRA, as well as the SAP (FSP) and QAPjP under CERCLA.)

Section 1. Table of contents.
Prepare a serial listing and page location of the CDAP elements.

Section 2. Project Background Data.
Project background data may be addressed as a portion of the workplan as outlined in section 2.1. In the event this material is addressed within the workplan (WP), the applicable WP sections should be referenced within this section of the CDAP. Regardless of location, this topic should include a summary of past chemical data of significance, emphasizing any site specific problems encountered, identify data gaps, and briefly state an overview of the multi-media sampling to be carried out in the present work effort, and expected future work at the site.

Section 3. Chemistry Requirements to Support Project Data Quality Objectives (general).
The general chemistry requirements of sampling and analytical to be performed may be addressed as a portion of the workplan as outlined in section 2.1. In the event this material is addressed within the workplan, the applicable WP sections should be referenced within the CDAP. Regardless of location, these objectives must be defined in terms of project requirements, not just in terms of the capabilities of the test methods used. Define the general chemistry requirements to support project specific Data Quality Objectives (what questions must be answered and what decisions must be made). Chemistry-specific requirements are formulated as a result of the data needs and project specific DQOs and should be addressed within the CDAP by matrix. These chemistry-specific requirements include choosing methods of sampling, sample preparation, chemical analysis, by specifying the minimum quality of data required to draw valid conclusions which support the project data needs to finalize the project decision statements. Each of the matrices in the SOW section 5: Field Activities, and each of the analytical parameters in the SOW section 7: Laboratory Activities, must include the detailed discussions of chemistry-specific requirements for sampling and analyses required for the CDAP.
In addition, any relevant Chemical specific ARARs should be summarized to verify the specified methods are applicable and are able to confidently achieve quantitation limits below the maximum contaminant levels promulgated. Reference section 2.1. for incorporation of this information within the workplan, and reference applicable WP sections within the CDAP.

Section 4. Contractor Project Organization and Functional Areas of Chemistry Responsibilities.
The project organization for the A-E and any subcontractors as

related to analytical activities should be clearly defined, including a discussion of quality control responsibilities. The A-E's Quality Assurance (QA) Officer should report to a responsible senior officer of the company (i.e., QA management should be separate from project management). A list of all individuals should be provided and it should include QC officers for the various project components (those responsible for initiating and carrying out corrective actions and those involved in the data reporting sequence) and all analytical laboratory personnel (supervisors, chemists, and technicians). For laboratory personnel that are not included in the Lab Quality Management Manual, resumes listing education and experience are required. Resumes listing education and experience are required for all (non-laboratory) personnel collecting samples. Also include information about the anticipated primary (contract) laboratory with a brief description of name, location, facilities, and capabilities.

Section 5. Field Activities:
This section of the CDAP is critical because collecting representative samples in both time and space is crucial to subsequent decision making and legal defensibility of the data. Good analytical results on non-representative samples are worthless, and lead to incorrect decisions and/or invalidation of the data. Selecting appropriate sampling locations and schemes is contingent upon the project specific DQOs developed for the project and / or site. This section should summarize field activities while emphasizing chemistry-specific requirements related to the project's DQOs.

(l)Field Instrumentation and Equipment.
This section should itemize all sample screening and analytical equipment to be used (brand, model) and outline the corresponding calibration procedures and required frequency. In the event equipment is purchased for use during a project, final disposition of this equipment should be addressed. Describe non-standard or modified methods fully. List the required sample handling equipment for the work effort. Also specify the composition of the sampling devices (stainless steel, teflon, PVC, high-carbon steel, etc.) necessary.

(2) Field Documentation.
Daily Quality Control Reports (DQCRs, see section (3) below) should be prepared, dated, signed by the site manager, and sent to the Contracting Officer Representative (COR) at a

rate approved by the contract. Due to the brevity of these forms, additional documentation requirements are advised, especially when field analytical or screening is occurring. This may include documentation within a field logbook encompassing (1) a system for identifying and tracking the samples acquired that day which describes the location (by sketch), the physical description of each sample, identification of samples taken as replicate (field QA/QC) samples, and any pertinent information which may affect the sample; (2) details of the calibration, and results of field analytical or screening performed; (3) and any deviations performed from the procedures outlined in the CDAP. All information should be recorded in permanently bound notebooks with indelible ink. It may also be advisable to require a daily review for completeness and sign off of this logbook by the field QA officer or senior sample technician / chemist. Special emphasis should be placed on documenting field control samples to their respective field samples as noted in (4) below. The logbook pages should be copied and included in the Final Report with chain-of-custody sheets and the analytical data. This will allow the reviewer a chronological confirmation of the samples origin, transfer, and analysis. This section of the CDAP should define specifically the sample identification system to be employed in the field for all samples, including field QC/QA duplicates, rinsates, and trip blanks (if required). Examples of the chain-of-custody form and sample label(s) should also be included in the CDAP. As noted, this section should cross-reference (and be consistent with) section 6 of the CDAP. All field documentation generated must become part of the project files.

(3) Daily Quality Control Report (DQCR)

During the field investigation activities DQCRS should be prepared daily, dated, signed by the site manager, and sent to the Government (COR) at a rate specified in the SOW. This section of the CDAP should summarize how the A-E will prepare DQCRs. These reports should include (at a minimum, with respect to chemistry) weather information at the time of sampling, samples taken with reference given to appropriate sections of the CDAP, field instrument measurements, calibrations, departures from the approved CDAP, problems identified, corrective actions, and verbal/written instructions from Government personnel. Any deviations which may affect DQOS must be conveyed to USACE personnel (TM, project chemist, etc.) immediately. Project-specific DQCR requirements, as noted in the SOW, should also be included in this section of the CDAP. All field documentation generated must become part of the project files.

(4) Field QC and QA Samples.
ER 1110-1-263 requires that Field Quality Control (QC) and Quality Assurance (QA) samples be collected and analyzed by the primary (A-E's contract) laboratory and the secondary (USACE QA) laboratory, respectively. The QC samples are used by the A-E and the primary (A-E's contract) laboratory to identify and diagnose problems related to sampling and analysis. QA samples are sent to a secondary (USACE QA) laboratory by overnight delivery for Government monitoring of sample handling and of the performance of the primary laboratory. These QC and QA samples include splits or replicates of field samples taken at a minimum rate of 10% per matrix for each analytical parameter prescribed. However, the frequency of QA/QC sample acquisition is also dependent on project specific DQOS. If there is a possibility of litigation, a higher rate should probably be implemented. It may also be advised that the contractor split samples likely to exhibit contamination, or specifying particular locations or other criteria where field control samples should be generated. The frequency of QA/QC sample acquisition is best displayed in tabular form for each analytical parameter, matrix, and site under investigation. This clarifies between the A-E and the COR the exact the number of anticipated samples to be acquired. The USACE QA (secondary) laboratory designated for project should be indicated in this section of the CDAP. The A-E should be responsible for adding the appropriate project identification information to the sample labels and chain of custody records for all samples shipped to the contractor and QA laboratories. It is also advised to require field replicate samples sent blind to the primary (contractor's) laboratory. This requires the designation of a unique sample ID number to all field QC duplicates. The A-E should notify the secondary (QA) laboratory one (1) week prior to the first delivery of samples and at least 24 hours notice should be given for Saturday sample deliveries. The secondary (QA) laboratory must also be notified when the final shipment of samples has been sent at the completion of sampling activities. An important consideration within this section includes the documentation and matching of field QA/QC duplicate samples, and any other quality control samples to their respective field samples. Designation of critical samples should also be integrated in this section.

(5) Decontamination Procedures.
Describe decontamination of the sampling devices and itemize necessary decontamination supplies. Handling procedures and disposal of spent decontamination fluids (characterized as

investigation-derived wastes) must also be detailed. Specify the projected end-fate of decontamination fluids.

(6) Matrix: Groundwater Samples

This section of the CDAP should express the chemistry-specific requirements for groundwater samples to support project-specific DQOs. The project-specific DQOs for this section should be developed by a project team with potential input from a chemist, hydrologist, geologist, process engineer, and risk assessor. Chemistry-specific requirements are then formulated by the chemist in order to achieve the quality of data required in light of the DQOs. Tables are to be used whenever possible to clearly present information. Critical measurements taken while purging monitoring wells, and prior to groundwater sampling should be discussed in light of fulfilling DQOs. Discussion should also include qualitative QA objectives of sampling (maintenance of sample integrity, representativeness of media, comparability, others as applicable) and how not meeting the QA objectives will affect decision making and possible litigious actions. The goal of this section of the CDAP is an appropriate sampling strategy that ensures attainment of a representative sample which achieves the quality required by project management to make valid conclusions for project-specific decisions or regulatory actions.

(6)(a) Field Screening.

Field screening is primarily used to provide indications of contamination at analytical levels I and II. This general information may be used for a variety of reasons including: (1) to select samples for analyses at analytical levels III and IV, (2) to indicate "hot spot" contamination, (3) to direct soil boring or monitoring well installation and/or (4) to provide "general" data on sample contamination, or physical characteristics. Due to the diversity of field screening techniques, the project team may allow the contractor flexibility in prescribing the particular field screening application in light of the project specific DQOs. The contractor must then specify the details, within the CDAP, on the field screening technique proposed. All protocols are subject to USACE approval. Specific information required within the CDAP should include at a minimum: (1) a discussion of method-specific DQOs for the field data acquired, and how that data will effect project decisions, or the sampling approach, (2) details on the field methodology and required field equipment (its calibration and use), (3) required QA/QC to be implemented (onsite and

offsite), and (4) all documentation requirements. The project chemist, geologist, and/or geologist should propose the use of field screening techniques and at a minimum, outline its applicability to the project. Due to the limitations inherent to field screening data, any additional analytical requirements (levels III and IV) should also be discussed.

(6)(b) Sample Locations.

Summarize chemistry-specific requirements for sampling including analyte concentrations of interest. Describe the statistical method or scientific rationale to be implemented sampling sites and sampling frequencies. This should include a discussion of the sampling approach proposed (biased, random, sytematic, etc.) and the reasons supporting the decision. The project chemist should work with other data implementors to define an appropriate sampling approach or approaches used on a project. This is based upon many factors. Initially, the intent of the data (identification, characterization, confirmation, etc.) must be defined. This is then extrapolated to the type of approach necessary to acquire samples to make the required project decisions. Describe how site and/or sample selection will affect the validity of the resulting data and the project objectives. Provide the location of each sampling point on a site map. The A-E may have full discretion in locating sampling points or may be instructed by USACE (in the SOW) as to each specific sampling location. In either event, the A-E must ensure DQOS are met. This section of the CDAP should include tables and site maps listing sample locations, matrix, number of field samples, number of split/replicate samples, and the number of required rinsate, and/or trip blank samples. Sampling of background or upgradient samples is strongly recommended if contaminants of concern possibly occur naturally or information about other potential sources is being gathered. The background sample location strategy should also be developed with appropriate input from a geologist in light of site aquifer depth and flow conditions.

(6)(c) Sampling procedure(s).

This section should detail sampling methods, required sample volumes necessary for each analysis, and preservation requirements. Special attention and specification within the SOW should be given to unique sampling requirements. The necessity of sampling and analyzing any source water used in the well drilling / installation / development process' needs to be defined. Field parameters of pH, conductivity, and temperature are monitored and should meet the minimum criteria as follows before sampling: +/- 0.2 pH units, +/-

0.5°C, +/- 10% specific conductance readings. This section should include well sampling procedures to reflect the DQO's of the project, especially those chemistry-specific requirements based upon the selected analytical parameters. For example, containers for all volatile (VOAs) samples should be filled first with as little agitation of the water as possible. Preservatives (if applicable) should be added to the VOA bottles before filling and care should be taken not to overfill the containers. VOA samples must be filled completely with no headspace within the sealed vial. It should be emphasized that the contractor is responsible for implementing correct sample handling procedures, and deviations performed may be subject to resampling. SOPs should be outlined in the CDAP for field personnel on preservation procedures for each analytical method specified, and any sample manipulation required (i.e. filtration of water samples prior to preservation).

(6)(d) Analytical procedures.
Project specific analyses as related to DQOs should be specified in this section of the CDAP. The analytical procedures required for a project are developed by the data needs of the data users. The project chemist should work with other data users to define an appropriate analytical protocol for each site / subsite of the project. This is based upon many factors. Initially, the operations which lead to the "potential" contamination must be investigated to define potential constituents of interest. The acquisition of purchase inventories, or wastestream and/or disposal practices identification may help with this task. Potential breakdown products should be considered. Based upon input from other data users an appropriate protocol will be defined. The contractor may be given the flexibility to propose additional analytical requirements based upon experience, with eventual implementation based upon USACE approval. The chemistry-specific requirements of selected analytical parameters are then developed based upon the protocol identified. Each method should be specified exactly and in detail by one of the following: (1) reference to an EPA SW-846 method (2) reference to another EPA method (3) reference to an ASTM method (4) reference to another accepted published method (5) reference to an accepted published method with a description of any deviations from the published procedure or (6) complete description of the procedure. EPA SW-846 methods should be used where possible. Nonstandard methods are generally not allowed. In special cases that require the consideration of nonstandard methods (analytical level V), the primary laboratory must provide validation and/or provide data showing equivalency to a

standard method to the COR for approval. Analytical methods along with appropriate sample preparatory (digestion/extraction) methods identified must be appropriate for all analyses in the specific matrix at the anticipated concentrations. AGARS and DOS must be considered for they directly effect the identification of appropriate analytical methods and the requirements of sensitivity, precision, accuracy, and completeness of the prescribed procedures. This may include specifying a particular “low concentration" extraction method to be performed. Summarize all groundwater analytical procedures in this section of the CAP., including any field methods (analytical level I and/or II) employed. Include a table summarizing the required concentration range and sensitivity (detection limit), precision, and accuracy for chemical data to be collected. Guidance on quality control may be referenced within SW-846, Chapter One or within individual methods. This section should also define the required turn around time (TAT) for completed data reports, or any "preliminary" data submission. The required TAT is determined by the project specific DOS, and must be agreed to by the A-E, the primary (contractor's) laboratory, and the CAR. TAT necessary may differ between field generated data and fixed laboratory data, and should be addressed separately. Expedited data analysis and reporting from a fixed laboratory may incur additional charges, therefore all decisions must be made by all team members of the USAGE. The agreed TAT for results is not to be confused with the holding time requirements for sample analysis. It should be emphasized within the CAP. that the contractor is responsible for all analyses to be completed within the stated holding times for each analytical method.

(6)(e) Sample containers, preservations, holding times, transportation.

Sample containers, volumes, preservatives, and holding times for the project specific analyses should be presented in tables in this section of the CAP.. Any modifications to the standard methods must be approved by the CAR (may require concurrence from the secondary (USAGE A) laboratory) prior to their use. If a standard method is not available, the A-E contractor or subcontractors should propose a nonstandard method (with supporting validation data showing equivalency) and specifications on sample containers and preservatives for approval by the CAR. This section should also specify how samples will be labeled, packaged, and transported/shipped to the respective laboratories while maintaining chain of custody and holding times. Section 6 of the CAP. also includes general information regarding sample chain of custody, packing and shipping. Appendix F to ER 1110-1-263

(10/90) contains detailed information appropriate to this section. It should also be noted that one trip blank should be included per shipping cooler containing water samples to be analyzed for volatile organics. A temperature blank (VOA vial filled with water) may also accompany the shipment for ease of monitoring at the receiving laboratories.

(7) Matrix: Surface Water Samples

This section of the CAP. should develop chemistry requirements for liquid impoundment or surface water samples in light of the project DOS. These project specific DOS should be developed by a project team with potential input from a chemist, hydrologist, geologist, process engineer and risk assessor. Tables are to be used whenever possible to clearly present information. Critical measurements within surface water sampling should include qualitative A objectives (representativeness, comparability, others, as applicable) and how not meeting the A objectives will affect decision making and possible litigious actions. The goal of this section is the same as stated in section (6).

(7)(a) Field Screening.

See section (6) (a) above.

(7)(b) Sample Locations.

See section (6) (b) above.

(7)(c) Sampling procedure(s).

This section should specify sampling procedures used to acquire a representative liquid impoundment or surface water sample for chemical analysis. The actual procedures required depend on the nature of the liquid being sampled and may vary greatly. Items to be considered and described may include stratification, flow conditions, access, sampler design, and volume requirements for the planned analyses.
A discussion of surface water sampling in relation to chemistry-specific requirements must also be included in this section of the CAP.. The CAP. should also specify equipment (dipper, weighted bottle, bacon bomb, etc.) to be used in the field in light of the DOS expressed.

(7)(d) Analytical procedure(s).

See section (6) (d) above.

(7)(e) Sample containers, preservations, holding times, transportation.

See section (6) (e) above.

(8) Matrix: Leachate Sampling Methodology

This section of the CAP. should further develop DOS as required for leachate samples. The project specific DOS for this section should be developed by a project team with potential input from a chemist, hydrologist, geologist, chemical engineer, process engineer and risk assessor. The discussion should describe the procedures used to obtain samples of leachate emanating from a landfill, stream bank, or excavation side wall. Because of the wide range of settings and contaminant properties, additional subtopics are not discussed here; however, when preparing this section, the chemist and geologist should consider requiring recording information such as weather conditions, flow rates, volume requirements, sample disturbance effects, among others. In many cases it may be possible to allow the contractor the flexibility to propose sampling details within the CAP..

(8)(a) Field Screening.

See section (6) (a) above.

(8)(b) Sample Locations.

See section (6) (b) above.

(8)(c) Sampling procedure(s).

See section (6)(c) above.

(8)(d) Analytical procedure(s).

See section (6) (d) above.

(8)(e) Sample containers, Preservations,holding times, transportation.

See section (6) (e) above.

(9) Matrix: Soil Samples

This section of the CAP. should develop chemistry-specific requirements to support project specific DOS as required for soil samples. The project specific DOS for this section should be developed by a project team with potential input from a chemist, geologist, and risk assessor. Tables are to be used whenever possible to clearly present information. Critical measurements for possible field screening of soil samples should be discussed in light of fulfilling DOS. For example, screening may define which soil samples are submitted for fixed laboratory analysis, or taken in replicate. Discussion should also include qualitative A objectives (maintenance of sample integrity, representativeness of media, comparability, others as applicable) and how not meeting the A objectives will affect

decision making and possible litigious actions. The goal of this section of the CAP. is an appropriate sampling strategy that ensures attainment of a representative sample which achieves the quality required by project management to make valid conclusions for project-specific decisions or regulatory actions.

(9)(a) Field Screening.
See section (6) (a) above.

(9)(b) Sample Locations.
Include discussions for soil samples as outlined in section (6) (b) above. In addition to specifying sample location rationale (random, systematic, biased, etc.), soil sampling should include any relevant sample depth designations required. Special attention must be addressed to attain background soil concentrations, where appropriate.

(9)(c) Sampling procedure(s).
This section should detail sampling methods, required sample volumes necessary for each analysis, preservation requirements, and decontamination procedures for sampling equipment. Special attention and specification within the SOW should be given to unique sampling requirements. Using stainless steel or Teflon sampling equipment, enough solid material should be collected at one time from the specified depth interval for all containers. Volatile organic samples, including any duplicates, should be collected first, with as little mixing and delay as possible. Due to the inherent heterogeneity of soils, homogenizing procedures are conducted prior to containerizing the remaining analytical samples. The remaining material from the soil core should be placed in a clean stainless steel bowl and mixed thoroughly with stainless steel implements (spoon, spades, etc.), quartered, then approximately equal aliquots taken from each quarter to fill the required sample containers. QC and/or A sample containers should be filled from the same mixture as the "original" field samples. Any compositing of discreet sample locations or depths should be defined explicitly within the CAP.. Other methodologies, as warranted by the DOS, must be clearly defined in the CAP.. This section of the CAP. should include a table and site map listing sample location, matrix, number of field samples, number of split or replicate samples, and number of rinsate samples (if appropriate). It should be noted that rinsates are typically not required for soil sampling unless grossly contaminated media is anticipated, thereby increasing the chance of contaminant carry-over.

(9)(d) Analytical procedure(s).
See section (6) (d.) above.

(9)(e) Sample containers, preservations, holding times, transportation.
See section (6) (e) above.

(10) Matrix: Sludge/Sediment Samples.

(10)(a) Field Screening.
See section (6) (a) above.

(10)(b) Sample Locations.
See sections (6) (b) and (8) (b) above. Special attention must be given to establishing upgradient or background levels of contaminants in sediments on a site-specific basis.

(10)(c) Sampling procedure(s).
See section (8)(c) above.

(10)(d) Analytical procedure(s).
See section (6)(d) above.

(10)(e) Sample containers, preservations, holding times, transportation.
See section (6) (e) above.

(11) Matrix: Air Samples.
This section of the CAP. should develop chemistry requirements to support project specific DOS for air sampling. The project specific DOS for this section should be developed by a project team with potential input from a chemist, industrial hygienist, process engineer, and a risk assessor, and possibly an air monitoring expert and meteorologist. Air monitoring requirements identified here are not related to health and safety, but may include the determination of background concentrations of airborne contaminants at undisturbed sites and determination of emission rates from various remedial activities and alternatives. Concerns generally focus on gaseous emissions of volatile and semivolatile organics and particulate emissions of semivolatile organics and inorganics. The project team should collaborate with relevant regulatory authorities to develop analytical protocols which address potential regulatory requirements. This is especially important when method deviation is necessary. Modeling is utilized with the ambient air analytical results for eventual uses (DOS) within a risk assessment, engineering design and

controls, or ambient air regulatory requirements.

(11)(a) Sample Locations.
This section must summarize the scientific and regulatory objectives for the sampling of compounds of interest, as well as, fugitive emission components. In light of the DOS, this section must describe the statistical method and scientific rationale for choosing sampling sites and how these relate to site meteorology, and/or site task performance, as well as sampling frequency. Sampling sites will also be discussed in relation to the risk assessment requirements and/or contingency sampling. Describe how site sampling selections will affect the validity of the resulting data and the DOS. It should be made clear in this section who has decision authority for specifying sampling locations and frequencies.

(11)(b) Sampling procedure(s).
This section should detail the minimum required sampling for regulators and risk assessment requirements. The sample locations decision logic should include meteorological requirements and the criteria for relocating samplers to achieve the required DOS. This section should also provide the mobility requirements of the apparatus' and the number of concurrent potential sampling locations. Describe within this section each parameters specific constraints to be implemented with anticipated ranges (flow rate, run time, etc.), keeping in mind specific DOS (minimization of contaminant breakthrough) Reference individual analytical methods for guidance on this subject.

(11)(c) Analytical procedure(s).
Analytical methods should be chosen after considering data needs and uses. Methods may include both field screening techniques and in-depth laboratory analyses. Since many methods describe requirements for sample collection in addition to analytical procedures, this section should be carefully cross referenced with section 2.3.11 as well as additional requirements in the chemistry and air section (7). Analytical methods should be referenced from EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air (TO-l through TO-14), 40 CFR Parts 50 and 60, or other EPA reference. A USEPA bulletin board containing the most current method of analysis is available through the U.S.EPA Ambient Monitoring Technology Information Center (AMTIC). Information about the bulletin board may be requested from AMTIC at the following address:

US EPA
AMTIC, OAQPS
TSD/MRB (MD-14)
Research Triangle Park
North Carolina 27711

In addition, alternative methods may be referenced from the National Institute of Occupational Safety and Health (NIOSH) - Manual of Analytical Methods. Care must be taken when adapting the NIOSH methods to perimeter air monitoring. The project chemist and industrial hygienist should collaborate with any regulating authority on the applicability of the analytical method prior to its implementation. This section will describe all required analytical methods and the specific analyses as related to DOS. Each analytical method will be described in detail as the EPA Compendium Methods have not been published as fully validated and approved. The method description must also include detailing the A/QC to be implemented, since not all methods have standard A/QC established. Since neither EPA or USAGE has a laboratory validation procedure for these methods, the primary (A-E contract) laboratory must demonstrate the necessary background and expertise to perform the required analyses. The laboratory must have a well established SOP for each sample method preparation, recovery, and analysis. The laboratory must show previous experience with each method of concern including applications to air toxic compound analyses.

(11)(d) Sample containers, preservations, holding times, transportation. The chemist should verify within individual methods for sample container requirements. This should include a discussion of collection media requirements, submission of blank sample requirements, etc. All chain-of-custody procedures should be maintained as outlined. The laboratory must have a well established SOP for decontamination of sample containers (summa canisters) or media, as well as quality control screening to verify cleanliness.

(12) Matrix: Surface Samples (Wipe / Chip)

This section of the CAP. should develop chemistry requirements to support DOS as required for surficial wipe, chip, and/or bore samples. Surficial sampling (wipe / chip / bore) procedures are utilized to determine the presence of contaminants on surfaces, or structural matrices, such as the interiors/exteriors of buildings, metal surfaces, concrete pads, etc. The procedures described depend again on the contaminant and the surface conditions. For wipe samples,

the chemist and risk assessor preparing this section should consider the size of the area to be wiped, the appropriate solvent for the wipe, sample handling and packaging, among others. wipe or chip sampling is often incorporated in project specifications to determine if buildings, containers, or structures are contaminated prior to demolition/removal. If appropriate for the project, the chemist must review the past history of the site and specify the chemical parameters of interest. The risk assessor and industrial hygienist should be consulted as to potential analytical concerns and probable sample numbers necessary to characterize contamination in each specific application. Additional information on wipe sampling may be found in EPA 600/2-85-028 entitled "Guide for Decontamination of Buildings, Structures, and Equipment at Superfund Sites", and in EPA 560/5-85-026 entitled "Verification of PCB Spill Cleanup by Sampling and Analysis". The contractor typically proposes for review and approval the specific procedure to collect and analyze each wipe sample. Tables are to be used whenever possible to clearly present information.

(12)(a) Field Screening.

See section (6) (a) above. Few field screening techniques are applicable to surficial samples, with the exception of PCB screening.

(12)(b) Sample Locations.

See section (6) (b) above. In addition, the area (i.e. 10cm X 10cm) to be wiped, as well as A/QC sample acquisition must be delineated.

(12)(c) Sampling procedure(s).

The chemist should be aware that with wipe sampling, no action levels exist with the exception of PCBs. It is also not clear as to what solvent types are appropriate for various wipe-sampling schemes. This is dependent on the required analyses. The chemist may consult with the appropriate laboratory personnel to decide the appropriate liquid media to be used with that wipe. It is necessary to supply the laboratory with individual wipes for each analytical parameter run, as well as, sending a blank wipe sample for each parameter to allow quantification of any interferences from the filter (or gauze) or the liquid media used. Chip and bore samples require physically removing the media with a chisel or coring bit. Care must be taken to achieve as representative a sample as possible and identify alternative sampling procedures based upon the prescribed analytical methods; for this sampling procedure is not applicable to all analytical methods.

(12)(d) Analytical procedure(s).
See section (6) (d) above, as well as consulting with appropriate laboratory personnel on the applicability of an analytical method to this media.

(12)(e) Sample containers, Preservations, holding times, transportation. See section (6) (e) above.

(13) Matrix: Soil Gas Samples.
Soil gas analytical methods may be incorporated into a sampling scheme to determine the presence of volatile organics in the soil pores. Soil gas surveys are typically used to supplement or direct conventional soil and groundwater sampling and analyses. The utility of soil gas analytical methods vary depending upon the nature of the contaminant and the soil environment at a particular site. The chemist should be aware of the different types of soil gas methodologies (active or passive), and decide, if applicable, which best suits the needs of the project specific DOS. The chemist and geologist should collaborate in determining the pros and cons associated with available soil gas options, resources available, the extent of soil gas sampling to occur at the site, and the level of analytical testing best serving the project. Contractors should have significant input in proposing soil gas analytical approaches based on capabilities in-house or which may be subcontracted. The topics listed below are only typical for an active system. This section should be developed jointly by the geologist and the chemist and careful cross-referencing is necessary to the other chemistry-related sections for definition of the analytical procedures to complement these requirements for sampling procedures. Again the team should keep in mind that physical site properties, including soil types and surface features, can affect the applicability of soil gas sampling.

* Probe Design and Placement
* Probe Purging
* Sample Recovery
* Decontamination of Equipment
* Blank, Background, and Duplicate Samples

(13)(a) Field Screening.
See section (6) (a) above.

(13)(b) Sample Locations.
See section (6) (b) above.

(13)(c) Sampling procedure(s).
See section (6)(c) above as it pertains to soil gas samples. It is advised to allow the contractor the flexibility to propose details for sampling within the CAP..

(13)(d) Analytical procedure(s).
See section (6) (d) above. The chemist should be aware that compound-specific analyses are available compared to total analyses. If compound-specific analyses are being performed on-site, the chemist should consider specifying off-site laboratory confirmation at some frequency. A consideration should also be given when developing a soil gas study to monitor background levels of analyses of concern.

(13)(e) Sample containers, Preservations, holding times, transportation.
See section (6) (e) above as it pertains to soil gas samples, as well as consulting with appropriate laboratory personnel.

(14) Matrix: Drum/Tank Samples.
This section describes the procedures to be used for sampling containerized waste, including drums (both intact and perforated) and above- or below-ground tanks. Again, the number of combinations of site conditions and contaminant makes a detailed list of scoping requirements difficult to develop. This section would require input not only from the chemist and possibly the geologist, but also the industrial hygienist because of the significant safety threats while sampling these containers. Considerations may include sampler designs, the need for compositing and/or eventual bulking for disposal, remote drum opening/puncturing, potential stratification of the contents, among others. In many cases it may be possible to leave many of the details to be proposed in the plans by the contractor.

(14)(a) Field Screening.
See section (6) (a) above as it pertains to screening physical and hazardous characteristics testing of drummed material.

(14)(b) Sample Locations.
See section (6) (b) above. This section may be applicable if drum staging is to be done.

(14)(c) Sampling procedure(s).
See section (6) (c) above as it pertains to drum / tank sampling. With drum sampling, typical procedures include performing a preliminary assessment of drum markings, and

physical state of drums (avoid bulging drums). Remote drum punching is advised, with continuous monitoring for organic and explosive vapors while sampling.

(14)(d) Analytical procedure(s).
Analytical protocols for drums must be based upon suspected contents, applicable regulatory specifications, and final disposal. Past records or information should prove useful. If the waste is to be moved off-site, RCRA characterization should be performed. Used oil, or PCB-containing waste may require other analytical approaches. The projected end-fate of the drummed contents should be considered when the chemist develops the analytical approach. Compatibility testing protocols may be used at sites with drums to minimize the number of wastestreams requiring disposal. Field screening versus off-site laboratory analyses are two considerations for implementing the analytical program for drums. Input from the project regulatory expert should be obtained to assist the chemist in decisions regarding drum analytical protocols. The analytical testing to be run on the bulked wastestreams may fully depend on the ultimate fate of the wastes. The contractor should be given liberal input in this aspect of the project.

(14)(e) Sample containers, Preservations, holding times, transportation.
See section (6) (e) above.

Section 6. Sample Chain of Custody, Packing and Shipping.
This section of the CDAP will contain a complete description of all custody procedures, forms, documentation, and personnel responsible for implementation as needed to ensure both the scientific credibility and the legal defensibility of data obtained for all project samples. There may be project- specific variations on sample chain of custody (COC) requirements based on DQOs. Sample custody discussions in this section of the CDAP should include both field and laboratory operations. At a minimum, all sample labeling, packaging, transportation, and chain of custody procedures should follow the USACE Sample Handling Protocol (Appendix F of ER 1110-1-263).
Samples collected for most projects are to be considered as low concentration environmental samples for packaging and shipping purposes, unless otherwise stated within the SOW. Note that no chemical analytical samples should be held on site for more than 24 hours.

Section 7. Laboratory Activities:

(1) Cooler Receipt Form

This section should describe the details to be implemented by the primary (and secondary) laboratories for logging in the incoming samples. The information should be gathered on the Government "Cooler Receipt Form" or equivalent to verify the condition of the samples upon receipt at the laboratory. This information is used to assess the quality of the field sampling, sample handling, label and chain of custody accuracy *I* completeness, and shipping procedures. This section should also include specifics of the chain of custody and storing procedures necessary for the project's samples from the field through the laboratory. In order to verify that all samples are received at 4 degrees Celsius, all laboratories should measure the surface temperature of the incoming samples. An option to this method would be to accompany the shipment with a temperature blank. This may consist of an additional VOA vial filled with water within the cooler during shipment for temperature measurement at the receiving laboratory. All preserved (acidic or alkaline) water matrices (except VOA) should be checked with pH paper or other means upon receipt. In the event samples are received unsatisfactorily at either the primary or secondary laboratories (e.g. insufficient cooling or preservation, incorrect sample volumes or bottles used, broken bottles, etc.), a mechanism should be in place to notify the field personnel as well as the USACE project manager and project chemist. The USACE should be notified immediately to decide whether resampling (at no cost to the Government) is warranted.

(2) Instrument Calibration and Frequency.

Description of the procedures used for calibration (including pre- and post- calibrations) and frequency of calibration checks is required for each instrument or method (including field instruments). These should be consistent with the requirements of the contract and the analytical method.

(3) Quality Control Procedures

Quality control checks are necessary to evaluate performance reliability for each measured parameter. Describe procedures to assess the precision, accuracy, and completeness of each measurement. State clearly the proposed number and type of internal laboratory QC checks and samples (e.g., blanks, duplicates, splits, spikes, surrogates, and reference standards, as applicable). At a minimum, these should be run at the rates prescribed within the individual methods. In

some cases, the precision and accuracy criteria published within the analytical methods may be sufficient for the data end use and should be referenced for each analytical method specified. Specify the applicable quality control tables from within the methods for criteria to be maintained during sample analysis. For methods which do not publish quality control criteria, the chemist should specify the criteria to be maintained individually. Guidance on this subject may be referenced from SW-846 Chapter One, and Contract Laboratory Program (CLP). State the primary laboratory's established practice for including laboratory control samples (LCS) among the samples analyzed, and any additional controls required by the project. Describe the feedback systems used to identify problems by means of the results obtained from these control samples. Limits of data acceptability should be included. Results from the primary laboratory internal quality control checks should be reported with the analytical data.

(4) Preventive Maintenance

The instruments, including manufacturer, model, accessories, etc. should be specified and preventive maintenance should be described. Records of repairs, adjustments, and calibrations should be maintained and available for inspection by the Government upon request.

(5) Corrective Action

This section of the CDAP will include a project-specific contingency plan for corrective actions to be taken by the primary laboratory when results appear unusual or trigger points are violated. Trigger points or unusual results are pre-specified conditions which will automatically require corrective action. This applies to both in-house analytical methodologies and to the condition of samples upon receipt at the lab. The CDAP should specify personnel responsible to initiate, approve, implement, evaluate, and report corrective actions. Describe how reestablishment of control is demonstrated and documented. Specific responses and procedures must also be specified when corrective action is needed. When QA/QC problems are identified, the A-E should notify the USACE PM as soon as possible. This notification should be expected to occur within 48 hours after the problem is identified.

(6) Data reduction, assessment/validation, and documentation.

The main purpose of this section of the CDAP is to show how the A-E and contract labs plan to maintain good data quality throughout data reduction, transfer, storage, retrieval, and

reporting. The names of individuals responsible (analyst, section leaders, QA officers, etc.) , and critical control points for each step should be summarized.
The A-E should include equations (including units) required to calculate the concentration or value of the measured parameter. Describe the data management systems which collect raw data, store data, and document quality control data. If statistical procedures are used for data review before reporting, include descriptions. Data assessment/validation procedures and organization should be specified, or task the Contractor to propose data review and assessment details in the CDAP based on these guidelines. In the event an independent full validation of the data is warranted by project DQOS, guidance may be referenced within the User's Guide to Contract Laboratory Program, Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, and Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses. The primary (A-E's contract) laboratory, and/or the A-E should hold (and make available to the Government) all project raw data for a (minimum) period of seven (7) years after the project samples have been analyzed.

(7) Quality Control Summary Report (QCSR).
A report by the A-E contractor at the conclusion of a project. This report is outlined within section 8 Chemical Data Quality Management Deliverables, paragraph (5).

(8) Method Specific DQO's.
Summarize with a table the quantitative objectives for PARCC parameters and sensitivity. This includes practical quantitation limits, precision (both within (lab duplicate) and between samples (field duplicate), accuracy, completeness (as required to achieve a specific statistical level of confidence), comparability, and representativeness. Discuss how data quality indicators will affect the legal defensibility of the data. DQO's for accuracy and precision, established for each measurement parameter, will be based on prior knowledge of the specific measurement system used and method validation studies employing replicate analyses, spikes, standards, calibrations, recoveries, control charts, and project specific requirements. Completeness refers to the amount of valid data obtainable from sample acquisition to the measurement system compared to the expected amount of data, and is usually expressed as a percentage. Comparability expresses the confidence with which one data set can be compared to another. Representativeness is the degree to which the data accurately and precisely portrays the environmental condition being studied.

Section 8. Chemical Data Quality Management Deliverables.
The A-E should address the frequency and content of chemical data quality control reports that should be submitted during the project in this section of the CDAP.

(1) A-E Daily Quality Control Reports (A-E DQCRs). During the field investigation activities, the A-E should provide Daily Quality Control Reports (DQCRs) to the COR. These reports should be compiled and submitted at least once every week, or as specified in the SOW. These reports should include, but not be limited to, the minimum information listed in ERl1lO-l-263 plus any additional information requested within pertinent sections of the SOW.

(2) Laboratory Daily Quality Control Reports.
The A-E should provide Daily Quality Control Reports from the primary laboratory (as appropriate).

(3) Non-routine Occurrences Reports.
The A-E should send written reports of all significant problems resulting from non-routine occurrences to the USACE PM within 48 hours of the non-routine occurrence event(s). These reports should include problems identified, corrective actions, and verbal/written instructions from USACE personnel for sampling or re-analysis.

(4) Pre-draft Data Package.
As stated within the memorandum entitled "Minimum Chemistry Data Reporting Requirements for DERP and Superfund HTW Projects", dated 16 August 1989 a pre-draft final report will be submitted to the secondary (QA) laboratory for comparison between the data generated from the contractor's QC and the USACE QA laboratories. This review also encompasses an assessment of the internal quality control and method requirements, allowing a determination on the usability of the data generated during the project. This package of data should be submitted within 30 calendar days after the primary laboratory receives the last analytical samples from the field. A definitive schedule must be agreed upon between the COR and the A-E. This schedule is subject to change based upon the number of samples taken during the work effort, the turn around times required for analysis, etc. However, the timeliness of the USACE generated Chemical Quality Assurance Report (CQAR) (formerly QA/QC report) will be contingent upon the punctual release of this material and completeness of the data compilation. For these reasons, the USACE District project chemist may require the opportunity to

review the submittal for completeness and verification that DQOs were met prior to or concurrent with the release to the secondary laboratory.
This deliverable should contain at a minimum all of the items described below to allow the secondary (USACE QA) laboratory to review PARCC parameters.

(4)(a) Pre-draft Data Package Organization.
The data package should include a compilation of the following: Tables corresponding field samples to their respective QA/QC samples, and / or other batch quality control sample results, analytical results into subsections divided by analytical parameters, all project chain-of-custody papers, and project cooler receipt forms. The organization should be defined based upon the data user and volume requirements.

(4)(b) Minimum Data Reporting Requirements for the Pre-draft Data Package.
The data package should include all sample and internal quality control results such as method blanks, spike and surrogate recoveries, and replicate analyses which should meet or exceed the HTRW minimum data reporting requirements. (Interim data reports may be requested from the A-E if the project warrants.) The following are minimum data reporting requirements for the Pre-draft Data Package:

(4)(b)(1) Sample Identification.
The A-E should prepare a tabular presentation which matches the primary (A-E's contract) laboratory sample identifications to the secondary (QA) laboratory sample identifications. This table should identify all field duplicates and field blanks as such and should match their corresponding field samples where applicable.

(4)(b)(2)Cooler Receipt Forms.
The A-E should include copies of "Cooler Receipt Forms" or equivalent for all sample shipments to the primary (A-E's contract) laboratory. The A-E should complete and retain these forms for purposes of noting problems in sample packaging, chain-of-custody, and sample preservation. An example form is available from the secondary (Government QA) laboratory.

(4)(b)(3)Chain-of-Custody Papers.
The A-E should include copies of all chain-of-custody papers for all sample shipments to the primary (A-E's contract) laboratory. The primary laboratory should sign and date these forms upon receipt of the shipment, and retain them for

verification of sample transfer and receipt. An example form is available from CEMRD-ED-EC.

(4)(b)(4)General Organic and Inorganic Reporting.
For each analytical method run, the A-E should report all analytes for each sample as a detected concentration or as less than the specific limits of quantitation. Each sample's data sheets should be clearly identified as belonging to a specific analytical batch and corresponding QC data reported. Generally, all samples with out-of-control spike recoveries should be reanalayzed, at no cost to the government, to verify matrix interferences. Only after reanalysis and verification that the out-of-control situation shows the same constituent resulting in the same bias direction and magnitude, should data be flagged accordingly. A summary all data flags to be used in data reporting should also be presented (note: CLP flags are acceptable). The event of flagging data should be rare. All soil and sediment samples should be reported on a dry-weight basis with percent moisture also reported, unless otherwise approved. The A-E should report any dilution factors for each sample as well as the date of extraction (if applicable) and analysis.

(4)(b)(5)Internal Quality Control Reporting.
A complete set of Quality Control results should be reported for each analytical batch even if some of the QC was not performed on samples from the USACE project. At a minimum, internal quality control samples should be analyzed at rates specified in the methods or at higher rates if required to meet project-specific Data Quality Objectives. The following is the minimum internal quality control to be submitted:

(4)(b)(5)(A) Laboratory Blanks (Method Blanks and Instrument Blanks).
All analytes should be reported for each laboratory blank. All sample results should be designated as pertaining to a particular laboratory blank through the corresponding analytical batch.

(4)(b)(5)(B) Surrogate Spike Samples.
Surrogate spike recoveries should be reported for all organic method reports, where appropriate (i.e. when the method requires surrogate spikes). The report should also specify the control limits for surrogate spike results as well as the spiking concentration. Any out-of-control recoveries, as defined within the specified method, should result in the

sample being re-analyzed (with both sets of data reported), and the data being flagged (if applicable).

(4)(b)(5)(C) Matrix Spike Samples.
Matrix spike recoveries should be reported for all organic and inorganic analyses. All general sample results should be designated as corresponding to a particular matrix spike sample. The report should indicate what field sample was spiked, even if it was not a USACE project sample. This procedure does not give any information about the matrix being sampled, however. It is better to require the primary laboratory perform the method-required matrix spikes on USACE samples. The report should also specify the control limits for matrix spike results and each method and matrix. Out-of-control occurrences are treated the same as surrogate spike recoveries outlined above.

(4)(b)(5)(D) Laboratory Duplicates and/or Matrix Spike Duplicate Pairs.
Relative Percent Difference should be reported for all duplicate pairs as well as analyte/matrix-specific control limits.

(4)(b)(5)(E) Laboratory Control Samples.
When run for a method's internal quality control, Laboratory Control Sample (LCS) results should be reported with the corresponding project sample data. Control limits for LCSs should also be specified within this presentation.

(4)(b)(5)(F) Field Duplicates and Field Blanks.
The A-E should identify field duplicates, reported as any other field sample. Relative Percent Differences should be reported for all field duplicate pairs.

(5) Quality Control Summary Report (QCSR).
In this document the A-E addresses quality control practices employed and summarizes the DQCRs. For investigation activities, the QCSR may be included in the Investigation Report. The project requirements for this deliverable should be defined within the SOW whether this is a separate submittal or incorporated into another. Issues covered in this report should include a discussion of all data points which may have been influenced or compromised and their impact on the Data Quality Objectives or remedial decisions. An example of the elements required for this level of effort are presented below, but are not limited to the following items:

(5)(a) Project Description.
Elements of this item include report organization, background information, and site description.

(5)(b) Laboratory Quality Control Activities.
Elements of this item include a summary of laboratory analytical methods, detection limits, quality control activities, a summary of any deviations from planned activities, and a summary of the evaluation of the data quality for each analysis and matrix.

(5)(c) Field Quality Control Activities.
Elements of this item include a summary of field sampling techniques for all matrices sampled. Include a summary of containers, preservation and transportation procedures, decontamination and cleaning procedures, calibration of field equipment, quality control activities, a summary of any deviations from planned activities, and a summary of the evaluation of the quality of the sampling.

(5)(d) Data Presentation and Evaluation.
Elements of this item include an assessment of sampling and analysis techniques, an evaluation of the data quality of each matrix and parameter, and an evaluation of the usability of the data.

(5)(e) Lessons Learned.
A summary of field or analytical procedures that could be changed or modified to better characterize chemical contamination in future work efforts.

(5)(f) DQCR Consolidation.
Daily Quality Control Reports are to be consolidated and summarized.

(5)(g) Conclusions/Recommendations.

3. Contractor Laboratory Validation. The following items are part of the contract laboratory validation process.

a. Commercial Laboratory Evaluation. The form "Evaluation of Commercial Laboratory" will be filled out by the project manager from a USACE District or Division and submitted to CEMRD-ED-EC for the proposed laboratory approval process. An example of the form is located in Appendix B of ER 1110-1-263. A memorandum may be substituted for this form provided it includes the following: (l)name of the project, (2)the contract number, (3)analytical methods to be used,

(4)numbers of samples for each matrix, (5)estimated dates of sampling, and (6)any additional certification requirements of the project.

b. Laboratory Oualitv Management Manual (LQMM) CEMRD-ED-EC should contact the laboratory requesting a copy of an off-the-shelf quality management manual or equivalent. The following information should be included in this submittal:

(1) Lab name, address, POC, phone No., lab age, number of employees, square footage.

(2) Type of analytical work routinely performed.

(3) Organizational chart and floor plan.

(4) Special capabilities.

(5) Previous evaluation/validation program and most recent results.

(6) List the EPA and USACE contracts held in the last two years.

(7) Copies of laboratory results and certificates for other environmental programs (USEPA WP / WS programs) or states.

(8) Chart of employees training and experience or chronological resumes.

(9) Copies of QA manual and/or in-house SOPs for analyses to be conducted for the contract including all internal quality control practices.

(10) List of the instruments to be used for the contract and dates of purchase.

c. Preliminary questionnaire. CEMRD-ED-EC will also send out a Preliminary Questionnaire for the laboratory to complete. The laboratory should return the questionnaire to CEMRD-ED-EC within 10 working days from the date of receipt. Many of the topics listed above are addressed within the questionnaire.

d. Performance Evaluation Samples. The LQMM and Preliminary Questionnaire will be reviewed to determine the laboratory's capability to perform the contract work. If the Government determines that the contract laboratory's capabilities appear to meet the project requirements, the Government will provide the contract laboratory with performance evaluation (PE) samples through CEMRD-ED-EC. The results will be submitted as directed within the shipment and within 20 calendar days after receipt of the PE samples. Failure to analyze these samples

correctly and within the required time frame may result in termination of the validation process. If any of the results are unacceptable, a second set of PE samples may be allowed. The performance evaluation samples are method and matrix specific. The results are considered passing if a particular method has no results outside three standard deviations as determined by the USACE, and no more than two constituents outside two standard deviations for multi-constituent analysis. Often a laboratory will be contacted if problems such as dilution or calculation errors can be identified.

e. Laboratory Inspection.

When the "Evaluation of the Commercial Laboratory" form, the LQMM, and the Preliminary Questionnaire have been reviewed and the PE sample have been successfully completed, the USACE will conduct an onsite laboratory inspection. The entire inspection normally takes approximately 8-hours. Post laboratory inspection, an exit interview will be held with laboratory personnel during which any problems identified are discussed. The laboratory will then have ten (10) working days to respond to deficiencies found during the inspection.

f. Approval.

A letter and a copy of the inspection report will be sent to the Government project manager and to the proposed contract primary laboratory. Ordinarily the letter will specify the methods and matrices, the project(s), and time period for which the validation is granted (usually 18 months). Centralized records of validations and laboratory performances are kept at CEMRD-ED-EC. If a primary laboratory obtains a second contract within the eighteen month period, previous performances will be checked. If different analytes/matrices are involved in the second contract, only those performance evaluation samples will be sent. If work done for the Government by the laboratory has been satisfactory, no further action will be necessary. A validated primary laboratory may not subcontract USACE samples to a second laboratory without the knowledge and approval of the Government AND unless the second laboratory is validated for the parameters concerned.

g. Expiration of Validation.

Towards the close of the eighteen month period CEMRD-ED-EC will notify USACE users of laboratories of pending validation expiration. After considering use of the laboratory and previous performance, CEMRD-ED-EC will determine which of the validation steps are needed to revalidate the laboratory.

4. Miscellaneous Requirements

a. Investigative Derived Wastes (IDW). Waste materials generated as a result of field investigations may potentially pose a threat to human health and the environment. For this reason, an approach toward management of these materials must be implemented to ensure protectiveness and compliance with potential ARARS (Applicable or Relevant and Appropriate Requirements) or regulations. The following is a list of types of IDW which may be encountered:

-Soil drill cuttings
-Drilling muds
-Groundwater from well development and purging
-Disposable sampling equipment
-Personal Protective Equipment (PPE)
-Decontamination fluids generated from sample equipment and personnel cleaning
-Laboratory IDW (sample remnants, aqueous / organic solvent wastes from analysis, etc.)

b. The waste management options available will depend on whether the project is being conducted under the auspices of CERCLA or RCRA. Reference EPA Guidance for the applicable ARARs in EPA/540/G-91/009, Management of Investigation-Derived Wastes During Site Inspections, May 1991 for guidance on this subject.